LED TV

Chassis : U8BA

Model : UA23H4003AR

SERVICE Manual

LED TV

UA23H4003AR

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1. Precautions

1-1. Safety Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

1-1-1. Warnings

WARNING

For continued safety, do not attempt to modify the circuit board.

Disconnect the AC power and DC power jack before servicing.

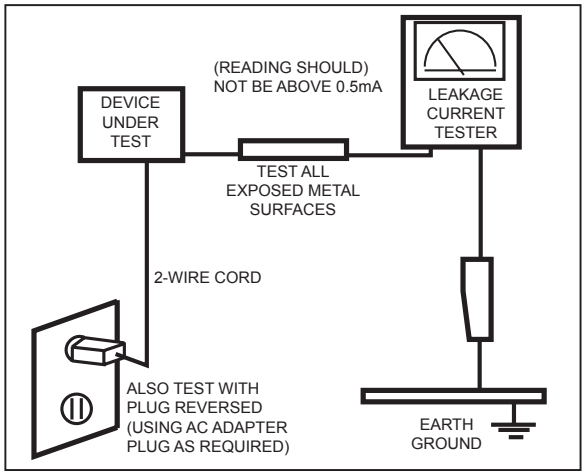
1-1-2. Servicing the LED TV

1. When servicing the LED TV, Disconnect the AC line cord from the AC outlet.
2. It is essential that service technicians have an accurate voltage meter available at all times. Check the calibration of this meter periodically.

1-1-3. Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistorcapacitor networks, mechanical insulators, etc.
3. Leakage Current Hot Check:



WARNING

Do not use an isolation transformer during this test.

Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI C101.1, Leakage Current for Appliances), and Underwriters Laboratories (UL Publication UL1410, 59.7).

4. With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts.
   The current measured should not exceed 0.5 milliamp.
   Reverse the power-plug prongs in the AC outlet and repeat the test.

1-1-4. Product Safety Notices

Some electrical and mechanical parts have special safetyrelated characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

1-2. Servicing Precautions

WARNING

An electrolytic capacitor installed with the wrong polarity might explode.

CAUTION

Before servicing units covered by this service manual, read and follow the Safety Precautions section of this manual.

NOTE

If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.

1-2-1. General Servicing Precautions

1. Always unplug the unit's AC power cord from the AC power source and disconnect the DC Power Jack before attempting to: (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
2. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
3. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
4. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
5. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to theblades of the AC plug. The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
6. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

1-3. Static Electricity Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION

Be sure no power is applied to the chassis or circuit and observe all other safety precautions.

8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.

1-4. Installation Precautions

1. For safety reasons, more than a people are required for carrying the product.
2. Keep the power cord away from any heat emitting devices, as a melted covering may cause fire or electric shock.
3. Do not place the product in areas with poor ventilation such as a bookshelf or closet. The increased internal temperature may cause fire.
4. Bend the external antenna cable when connecting it to the product. This is a measure to protect it from being exposed to moisture. Otherwise, it may cause a fire or electric shock.
5. Make sure to turn the power off and unplug the power cord from the outlet before repositioning the product. Also check the antenna cable or the external connectors if they are fully unplugged. Damage to the cord may cause fire or electric shock.
6. Keep the antenna far away from any high-voltage cables and install it firmly. Contact with the highvoltage cable or the antenna falling over may cause fire or electric shock.
7. When installing the product, leave enough space (0.4m) between the product and the wall for ventilation purposes. A rise in temperature within the product may cause fire.
8. If an equipment is provided with a replaceable battery, and if replacement by an incorrect type could result in an explosion (for example, with some lithium batteries), the following applies:

CAUTION

- Risk of explosion if battery is replaced by an incorrect type dispose of used batteries according to the instructions.
- Do not dispose of batteries in a fire.
- Do not short circuit, disassemble or overheat the batteries.
- Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.
- Do not be exposed to excessive heat such as sunshine, fire or the like.

2. Product Specifications

2-1. Product information

Model	UA23H4003AR		
Front View	* W : Width H : High D : Depth		
Detail View			
Front Color	Black		
Dimensions (W x H x D)	23"	With Stand	551.9 x 368.4 x 123.4 mm / 21.7 x 14.5 x 4.9 inches
		Without Stand	551.9 x 331.8 x 49.2 mm / 21.7 x 13.1 x 1.9 inches
Weight	23"	With Stand	3.0 kg / 6.0 lbs
		Without Stand	2.8 kg / 6.2 lbs
Panel Type	Anti Glare		
Internal Memory	64Mbtye		
DDR	None		
Feature	Media Play(Movie) / Sports mode		

2-2. Product specification

2-2-1. Detailed Specifications

NOTE

Design and specifications are subject to change without prior notice.

Item		UA23H4003ARMXL
General Information	Product	LED
	Series	4
	Country	INDIA
Display	Screen Size	23"
	Resolution	1,366 x 768
	Ultra Clear Panel	N/A
Video	Picture Engine	HyperReal Engine
	Clear Motion Rate	100
	Dynamic Contrast Ratio	Mega DCR
	Micro Dimming	N/A
	Precision Black (Local Dimming)	N/A
	Wide Color Enhancer (Plus)	Yes
	Wide Color Gamut	N/A
	Color Accuracy	N/A
	Auto Depth Enhancer	N/A
	Film Mode	Yes
	Natural Mode Support	N/A
Audio	Dolby MS10 / MS110	Dolby Digital Plus / Dolby AAC
	DTS Studio Sound / DNSe+	DTS Studio Sound
	DTS Premium Sound / DTS Premium Sound 5.1	DTS 2.0
	3D Sound	N/A
	Auto Volume Leveler	Yes
	Sound Customizer	N/A
	Sound Output (RMS)	3W x 2
	Speaker Type	Down Firing + Full Range
	Woofer	N/A
	HD Audio	
Smart TV	Smart Hub	N/A
	Samsung SMART TV	N/A
	On TV	N/A

Item		UA23H4003ARMXL
Smart TV	Movies & TV Shows	N/A
	Multimedia	N/A
	Apps	N/A
	News On	N/A
	Game	N/A
	My Space	N/A
	Social	N/A
	Fitness	N/A
	Kids	N/A
	Multi-Screen (Dual / Quad Screen)	N/A
	Skype™ on Samsung TV	N/A
	Web Browser	N/A
	AllShare Control	No
	Search	N/A
Smart Interaction	Voice Interaction	N/A
	Voice Control	N/A
	Camera Built-in	N/A
	Face recognition	N/A
	Motion control	N/A
Smart Convergence	Contents Streaming	N/A
	Screen Mirroring	N/A
	Samsung SMART View	N/A
	Smart Home	N/A
	Wake On LAN	N/A
	WiDi	N/A
Tuner/Broadcasting	DTV Tuner	Ready
	Analog Tuner	Yes
	MHP / MHEG / HbbTV / ACAP / GINGA / OHTV	No
Connectivity	HDMI	1
	USB	1
	Component In (Y/Pb/Pr)	1
	Composite In (AV)	1 (Common Use for Component Y)
	Ethernet (LAN)	N/A
	Headphone	No
	Audio Out (Mini Jack)	1

Item		UA23H4003ARMXL
Connectivity	Digital Audio Out (Optical)	No
	PC In (D-sub)	N/A
	PC/DVI Audio In (Mini Jack)	N/A
	RF In (Terrestrial / Cable input)	1
	Ex-Link (RS-232C)	No
	IR Out	N/A
	CI Slot	No
	Scart	No
	MHL CE 3.0	N/A
	One Connect (Jack)	N/A
	WiFi Direct	N/A
	MHL	N/A
	Dongle Ready (3G / LTE)	N/A
	HDMI 1.4 3D Auto Setting	N/A
	HDMI 1.4 A/Return Ch. Support	N/A
	InstaPort S (HDMI quick switch)	N/A
	Wireless LAN Adapter Support	N/A
	Wireless LAN Built-in	N/A
	Anynet+ (HDMI-CEC)	N/A
Design	Design	RHCM
	Bezel Type	NNB (12mm)
	Slim Type	Slim 2 (94mm)
	Front Color	Black
	Light Effect (Deco)	N/A
	Stand Type	Round
	Swivel (Left/Right)	N/A
	Camera Type	N/A
Additional Feature	Samsung 3D	N/A
	3D Converter	N/A
	Instant On	N/A
	N-KIT	N/A
	Quad Core+	N/A
	Accessibility	N/A
	Digital Clean View	Yes
	Auto Channel Search	Yes

Item		UA23H4003ARMXL
Additional Feature	Auto Power Off	No
	Clock&On/Off Timer	Yes
	Sleep Timer	Yes
	BD Wise Plus	N/A
	Caption (Subtitle)	No
	ConnectShare™ (USB 2.0)	Movie
	AC/DC TV	N/A
	Sports Mode	Basic
	Screen Capture	N/A
	Embeded POP	Yes
	EPG	No
	Extended PVR	N/A
	Game Mode	No
	History	N/A
	Multiroom Compatible	N/A
	OSD Language	English
	Picture-In-Picture	No
	Multi Tasking	N/A
	BT HID Built-in	N/A
	USB HID Support	N/A
	Smart Evolution Support	N/A
	TV SoundConnect	N/A
	Teletext (TTXT)	Yes
	Time Shift	N/A
	Triple Protector	Yes
	GUI	Single Lite
Eco Feature	Eco Mark	N/A
	Eco Label	N/A
	Eco Sensor	No
	Energy Efficiency Class	N/A
Accessory	3D Active Glasses (Included)	N/A
	Remote Controller Model	TM1240A
	Batteries (for Remote Control)	Yes
	Samsung Smart Touch Control (Included)	N/A
	Electric Stand Support	N/A

Item		UA23H4003ARMXL
Accessory	Electric Wall Mount Support	N/A
	Ultra Slim Wall Mount Supported	N/A
	Mini Wall Mount Supported	N/A
	Vesa Wall Mount Supported	Yes
	Floor Stand Support	N/A
	TV Camera (Included)	N/A
	IR Extender Cable (Included)	N/A
	Network Speaker (Included)	N/A
	Wireless Keyboard (Included)	N/A
	Wireless LAN Adaptor (Included)	N/A
	User Manual	Yes
	E-Manual	No
	ANT-Cable	N/A
	Power Cable	Yes
	Slim Gender Cable	N/A

2-2-2. Feature & Specifications

■ Feature

- RF, 1-HDMI, 1-Component, 1-A/V(Africa model:2-A/V), 1-USB2.0, 1 Audio Out
- Brightness : 250 cd/m^2
- Dynamic Contrast Ratio : Mega DCR
- Response Time : 8 ms

■ Specifications

Model	UA23H4003AR

Item	Description
Screen Size (Diagonal)	23 inches
LCD Panel	HD 60Hz
Display Colors	16.7M color
Display Resolution	1366 x 768
Input Signal	Analog 0.7 Vp-p ± 5% positive at 75Ω, internally terminated
Input Sync Signal	H/V Separate, TTL, P. or N.
Maximum Pixel Clock Rate	78MHz
AC Power Voltage & Frequency	AC100-240V 50/60Hz
Environmental Considerations	Operating Temperature: 50˚F ~ 104˚F (10˚C ~ 40˚C) Operating Humidity: 10% ~ 80%, non-condensing Storage Temperature: -4˚F ~ 113˚F (-20˚C ~ 45˚C) Storage Humidity: 5% ~ 95%, non-condensing
Sound (Output)	6W (3W X 2)
Note : Dolby Digital Plus / Dolby AAC, USB2.0, Film mode, Sports mode	

2-3. Accessories

NOTE

- The items' colors and shapes may vary depending on the model.
- Cables not included in the package contents can be purchased separately.
- The part code for some accessories may differ depending on your region.

Product	Code. No	Product	Code. No
• Remote Control	BN59-01175K	• User Manual	BN68-05733E
• Batteries (AAA x 2)	4301-000121	• Warranty Card (Not available in some locations)	6801-001984
• Power Cord	3903-000844		

3. Disassembly and Reassembly

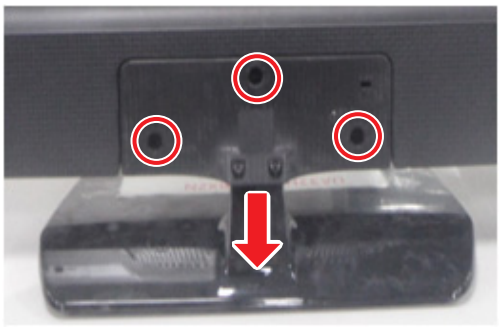
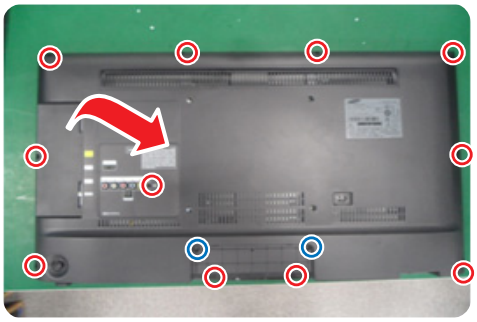
This section of the service manual describes the disassembly and reassembly procedures for the LED TV.

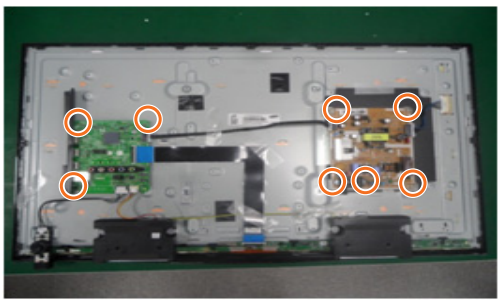
WARNING This LED TV contains electrostatically sensitive devices. Use caution when handling these components.

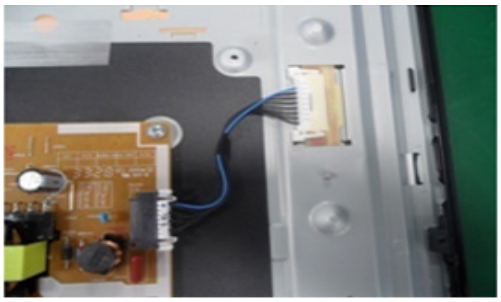
3-1. Disassembly and Reassembly

CAUTION

1. Disconnect the LED TV from the power source before disassembly.
2. Follow these directions carefully; never use metal instruments to pry apart the cabinet.
3. If there is no additional coment, it is same for all inches.

Description	Picture Description	Screws
1 Place TV face down on cushioned table.		
2 Remove screws from the Stand and Remove Stand.		6003-001782
3 Remove screws of Rear Cover.		6003-001782 6001-002755

Description	Picture Description	Screws
4 Remove the Rear-Cover.		
5 Remove screws of Main Board and Power Board.		 6001-003016
6 Remove the Speakers and Power Cables.		
7 Remove the LVDS Cable and Panel Drive Cable.		

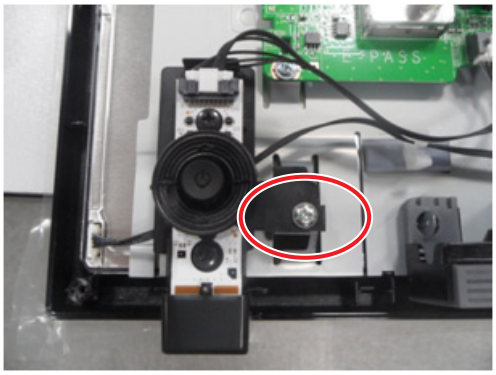
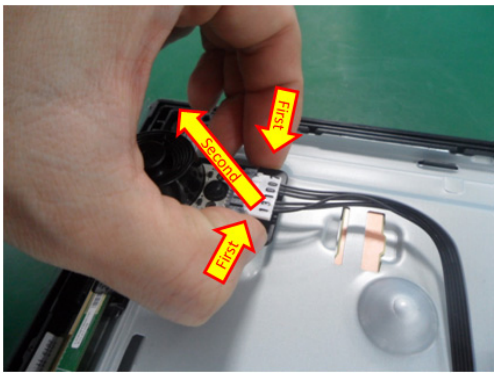
Description	Picture Description	Screws
		
8 Completed disassembly.		

NOTE

Reassembly procedures are in the reverse order of disassembly procedures.

3-2. Assy Board P-Jog Switch & Ir

■ How to disassembly

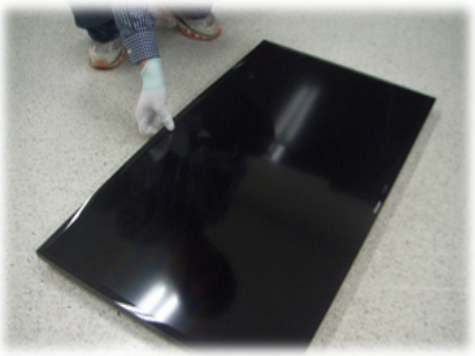
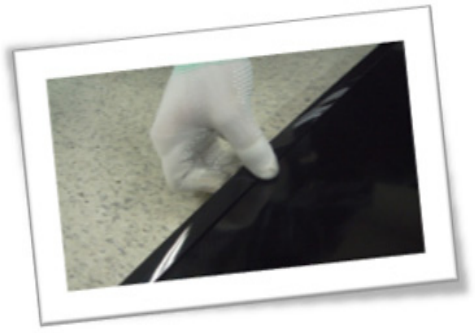
Description	Picture Description	Refer
1 open the Back cover.		
2 Pull out jog function.		
		

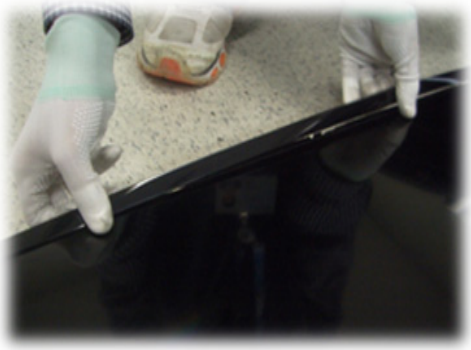
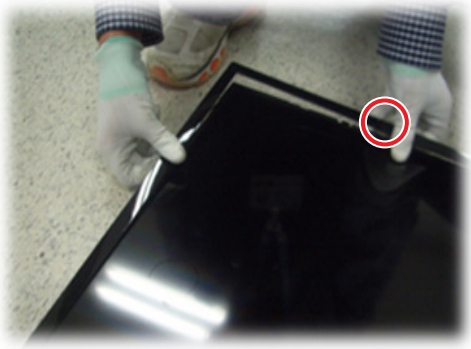
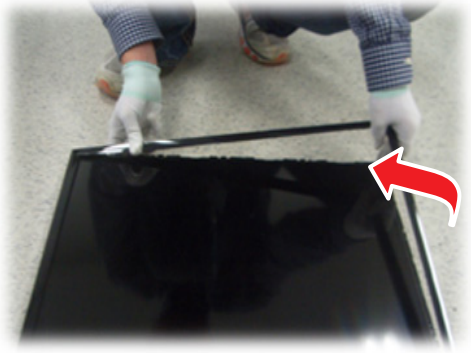
NOTE

Reassembly procedures are in the reverse order of disassembly procedures.

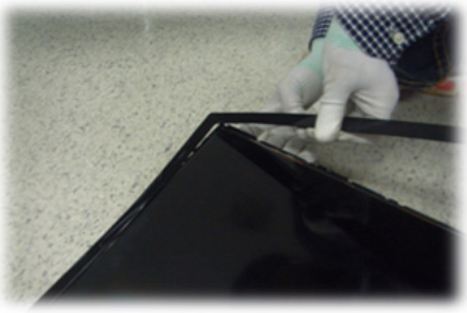
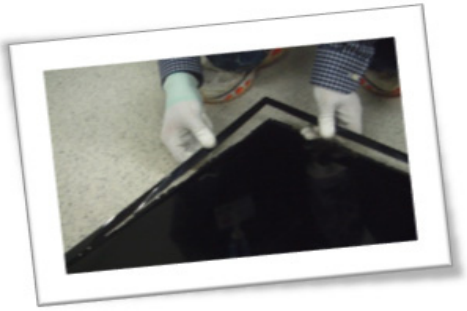
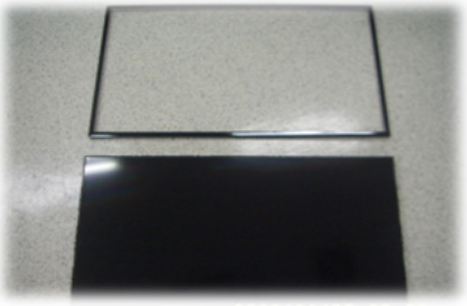
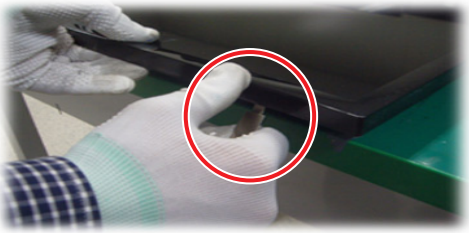
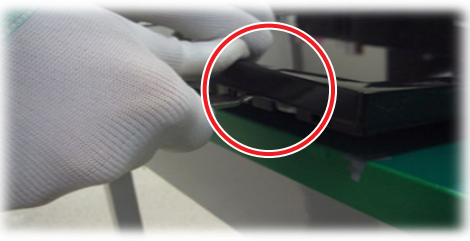
3-3. Disassembly(PTC)

■ How to disassembly

Description	Picture Description	Refer
1 Place TV face up on cushioned table.		
2 Products at the top of the central TOP-CHASSIS is rotated by 45 degrees outward and pulls.	 	

Description	Picture Description	Refer
3 Pull in the same way from the center of the top.		
4 Pull the left part of the product as shown while holding the raised portion on figure 3.		
5 Pull the bottom part of the product as figure 2 while holding the raised portion on figure 4.		

Description	Picture Description	Refer
6 As shown in the picture, Lift the bottom of the TOP-CHASSIS.		
7 Pull the products at the bottom of the right side of the chassis.		

Description	Picture Description	Refer
8 Lift the bottom of the chassis with one hand and holding the bottom of the product after you pull the right side of the product chassis.	 	
9 Disassembly is complete.		
CAUTION To use JIG : Does not lift the chassis by hand, JIG using the lift.	 	

NOTE

Reassembly procedures are in the reverse order of disassembly procedures.

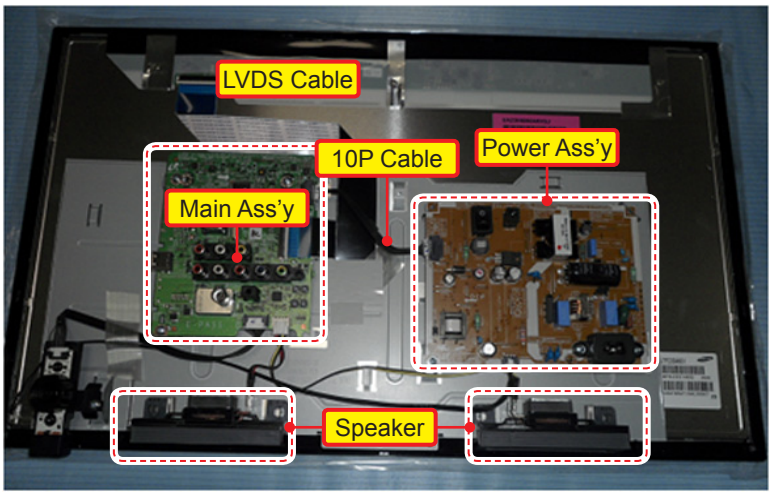
4. Troubleshooting

4-1. Troubleshooting

■ Check List for Initial operation

- AC Power Cord connected to the TV and the wall receptacle.
- Standby Power/IR Indicator LED is turned On.
- If Power/IR Indicator is not on check 14p power cable is connected and for correct Standby Voltage from SMPS to Main. Also check Jog Function Cable.
- Power turned On with Jog Function or Remote.
- Power on command from main Board to SMPS.
- Power/IR Indicator Flashes.
- Panel Back Lights are turned On.
- If no Backlights, unplug AC Power Cord, unplug 14 pin connector to SMPS, plug in AC Power Cord, Back light should come on. Check Main Board operation for error.
- Power/IR Indicator goes off.
- Picture or banner is displayed.

  * If nothing is displayed , check the LVDS cable.



Main Board Assy (CN201)			
9	A13V_PW	10	UNDER_DRIVER
7	A13V_PW	8	PWM_DIMMING_OUT
5	A13V_PW	6	SW_POWER_TO_SMPS
3	A13V_PW	4	GND
1	GND	2	GND

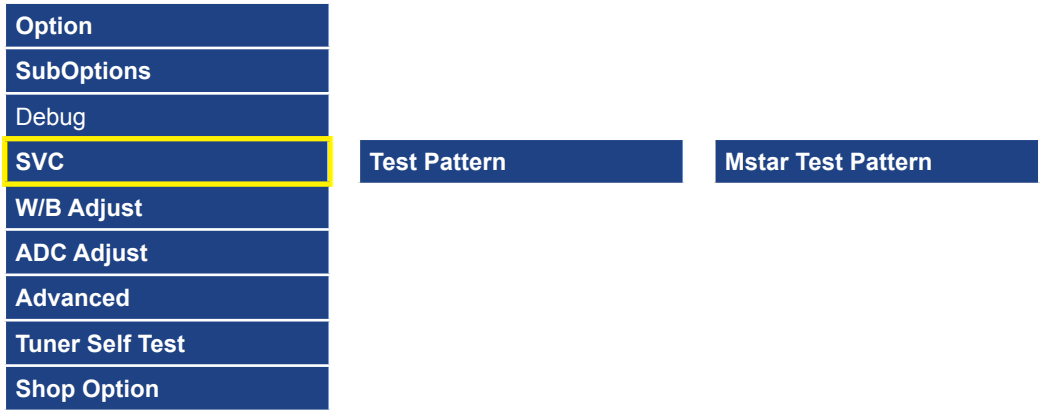
Power Board Assy (CNM803)			
1	A13V_PW	2	OD_UD
3	A13V_PW	4	BLU_PWM
5	A13V_PW	6	PWR_On/Off
7	A13V_PW	8	GND
9	GND	10	GND

■ How to know it is from Main Board or T-Con when some problems happen

1. No Picture : Backlight is on, but there is no picture and LED indicator in front of TV is blinking.
   - Check the LVDS Cable connection. If still problems, change the T-Con Board and then Main Board step by step.
2. Picture distortion : Enter the service mode ⋯› Choose 'SVC' ⋯› Check the 'internal pattern.'
   - Enter 'Service Mode.'
     - If you do not have Factory remote control

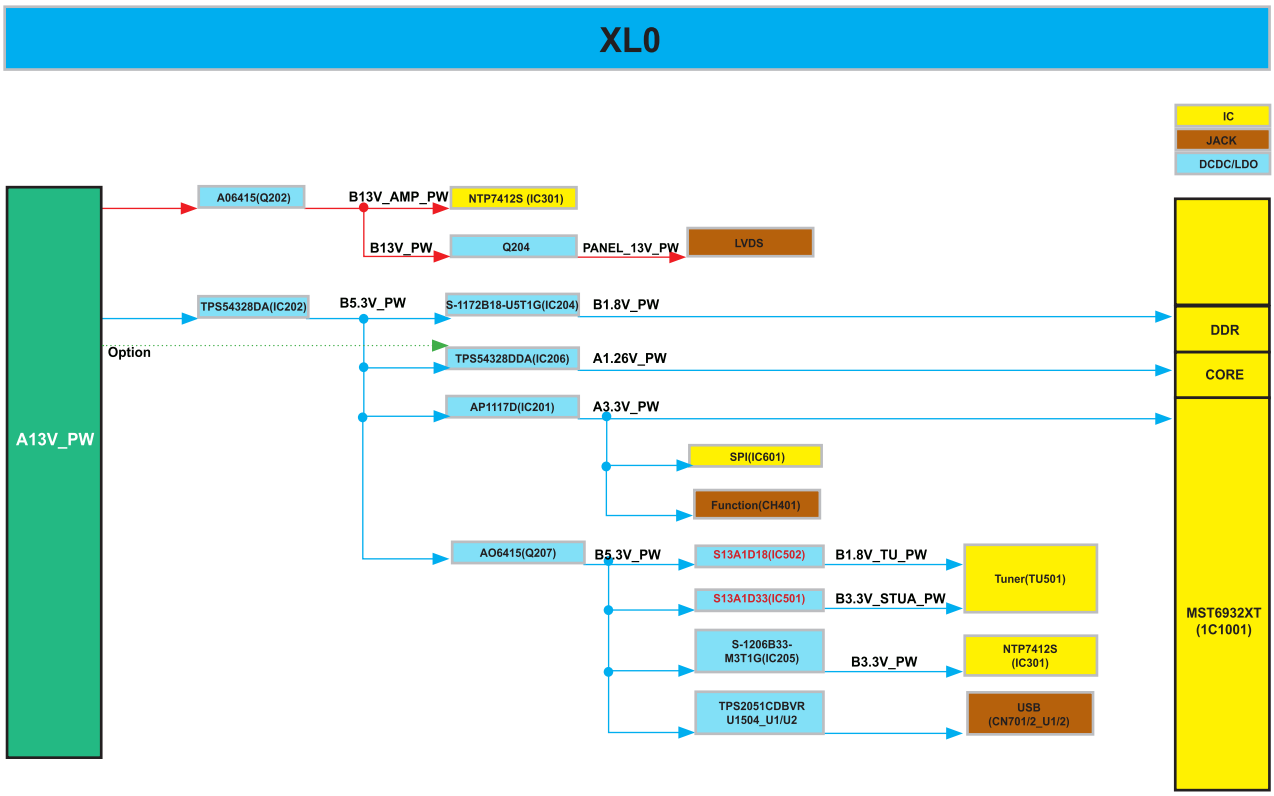
       Power OFF → Info → MENU → Mute → Power On
     - If you have Factory remote control

       INFO → Factory
3. Choose 'SVC.'
4. Choose 'Test pattern.'
5. Select the each pattern and then check all pattern is ok or not.



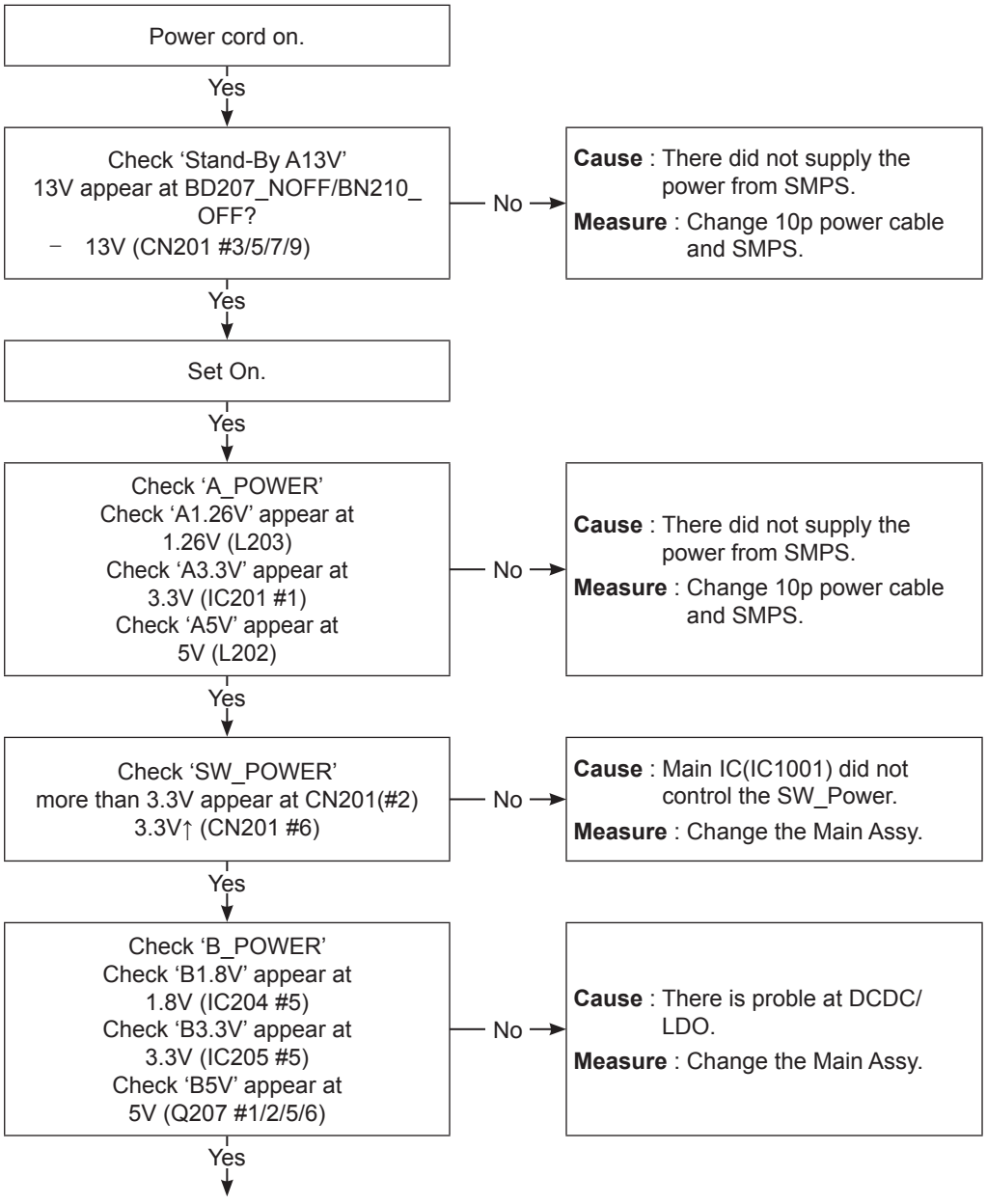
Pattern Status is	Change the	Test Pattern is made by the MSTAR IC
OK	Main Board	We guess front of MSTAR IC has problem.
NG	Panel and T-Con Board	We guess back of MSATR IC has problem.

■ Power-Tree

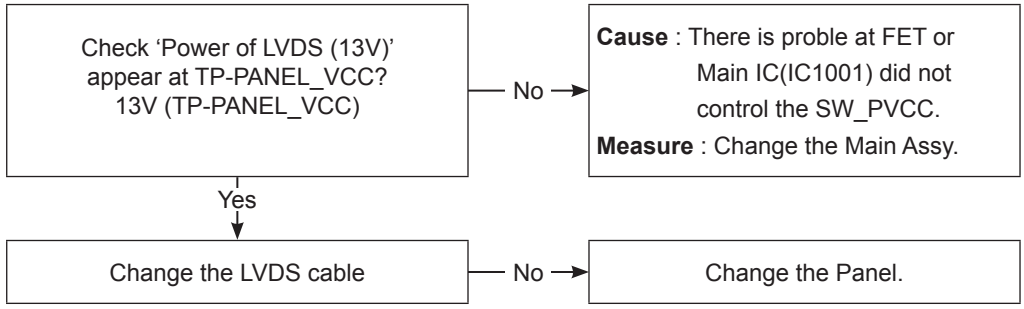

XL0
IC
JACK
DCDC/LDO
A13V_PW
A06415(Q202)
B13V_AMP_PW
NTP7412S (IC301)
B13V_PW
Q204
PANEL_13V_PW
LVDS
TPS54328DA(IC202)
B5.3V_PW
S-1172B18-U5T1G(IC204)
B1.8V_PW
Option
TPS54328DDA(IC206)
A1.26V_PW
AP1117D(IC201)
A3.3V_PW
SPI(IC601)
Function(CH401)
AO6415(Q207)
B5.3V_PW
S13A1D18(IC502)
B1.8V_TU_PW
Tuner(TU501)
S13A1D33(IC501)
B3.3V_STUA_PW
S-1206B33-M3T1G(IC205)
B3.3V_PW
NTP7412S (IC301)
TPS2051CDBVR U1504_U1/U2
USB (CN701/2_U1/2)
DDR
CORE
MST6932XT (1C1001)

4-2. How to Check Fault Symptom

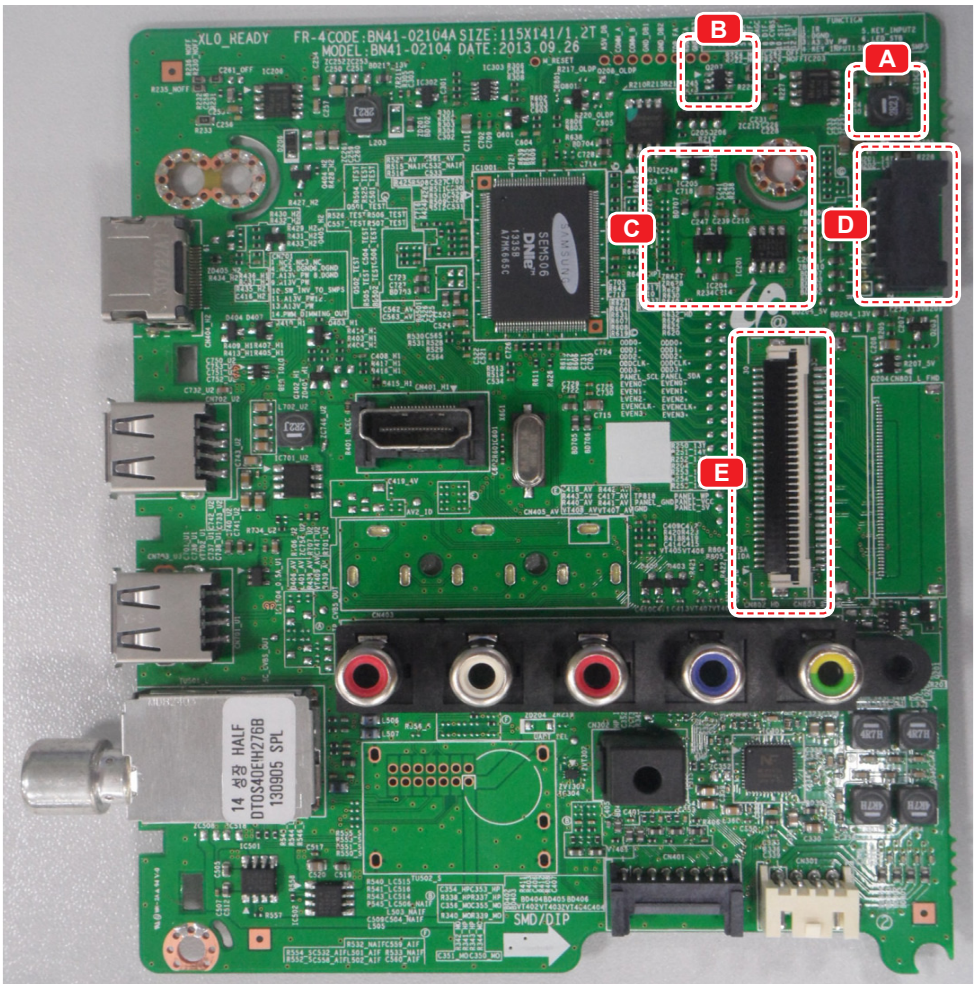
4-2-1.No Power and No Video

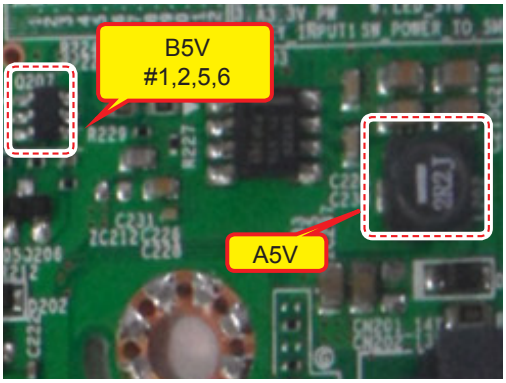
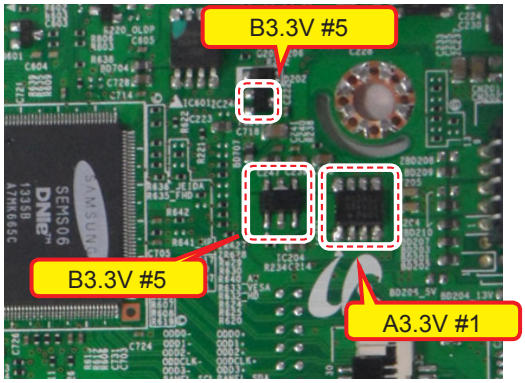
Symptom	• The LEDs on The front panel do not work when connecting The power cord. • The SMPS relay does not work when connecting The power cord. • The units appears to be dead.
Major checkpoints	The IP relay or the LEDs on the front panel does not work when connecting the power cord if the cables are improperly connected or the Main Board or SMPS is not functioning. In this case, check the following: • Check the internal cable connection status inside the unit. • Check the fuses of each part. • Check the output voltage of SMPS. • Replace the Main Board.
Diagnostics	

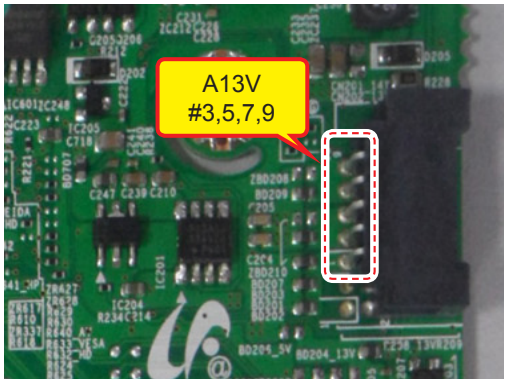
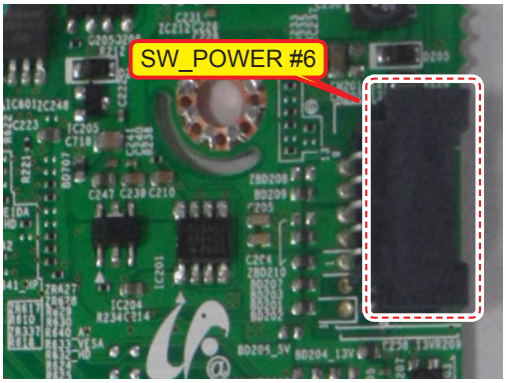
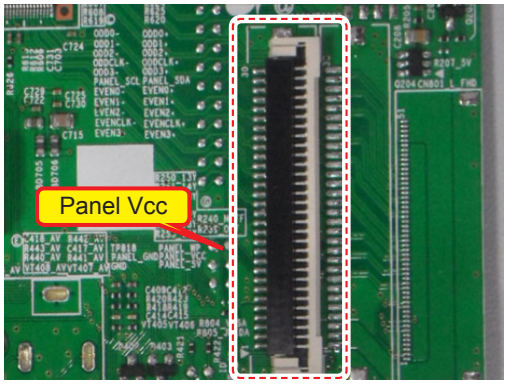
Power cord on.
Yes
Check 'Stand-By A13V'
13V appear at BD207_NOFF/BN210_OFF?
– 13V (CN201 #3/5/7/9)
No
Cause : There did not supply the power from SMPS.
Measure : Change 10p power cable and SMPS.
Yes
Set On.
Yes
Check 'A_POWER'
Check 'A1.26V' appear at 1.26V (L203)
Check 'A3.3V' appear at 3.3V (IC201 #1)
Check 'A5V' appear at 5V (L202)
No
Cause : There did not supply the power from SMPS.
Measure : Change 10p power cable and SMPS.
Yes
Check 'SW_POWER'
more than 3.3V appear at CN201(#2) 3.3V↑ (CN201 #6)
No
Cause : Main IC(IC1001) did not control the SW_Power.
Measure : Change the Main Assy.
Yes
Check 'B_POWER'
Check 'B1.8V' appear at 1.8V (IC204 #5)
Check 'B3.3V' appear at 3.3V (IC205 #5)
Check 'B5V' appear at 5V (Q207 #1/2/5/6)
No
Cause : There is proble at DCDC/LDO.
Measure : Change the Main Assy.
Yes

Diagnostics	
Caution	Make sure to disconnect the power before working on the IP board.

■ Location of Parts

Main Board_Front


Detail			
A B		C	

Detail			
D		D	
E			

4-3. Factory Mode Adjustments

4-3-1. Detail Factory Option

NOTE

If you replace the main board with new one, please change the factory option as well.
The options you must change are "**Type**".

■ UA23H4003ARMXL

Inches		23"
PANEL	Vendor	SDC
	Code	BN07-01309A
	Spec.	LTF230AN01
SMPS BOARD	Vendor	SEM
	Code	BN44-00693A
	Spec.	L23S0N_ESM
MAIN BOARD	Chassis Ass'y	BN91-11940A
	PBA Ass'y	BN94-07133A

Byte	Item	
0	Factory Reset	-
1	Type	23A6AH0E
2	Model	H4003
3	SVC Model	4003
4	Local Set	ED_INDIA
5	Tuner	Ready
6	Ch table	NONE

4-3-2. Entering Factory Mode

o enter ‘Service Mode’ Press the remote -control keys in this sequence :

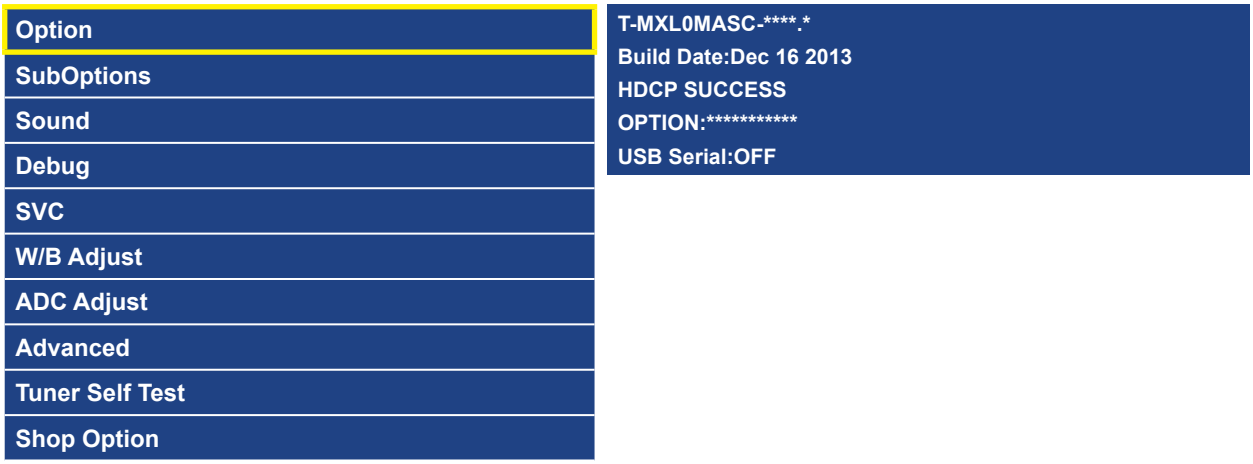
- If you do not have Factory remote control

  Power OFF → MENU → Info → Menu → mute → Power ON

- If you have Factory remote control

  INFO → Factory

- If you don’t have Factory remote control, can’t control some menus.



PANEL			Code	BN07-01309A
			SPEC	LTF230AN01
IP Board			Code	BN44-00693A
MODEL NAME			-	UA23H4003ARMXL
No.	Contents		Detail Items	INDIA
			Option	
1	Factory Reset	-	-	-
2	Type	-	19B6TH0E/19L6TH0E/ 22D6TH0E/…	23A6AH0E
3	SW Model	-	H4000/H4003/H4060 /H4100/H5000H5100	H4003
4	BOM Model	-	4000/4003/4060/4100/ 5000/5100	4003
5	Ch Table	-	Off/TSE/SDMA/SAVINA/SEIN/ TSEC/SEIL_N/SEIL_C	NONE
6	Local Set	-	EA_CHINA/EA_INDIA/EA_SRI/ EA_NEPAL/EA_BANGLA/EA_ EGYPT/EA_LIBYA/EA_M_ASIA/ EA_SAUDI/EA_PAK/EA_E_ASIA/ EA_AFR/EA_S_AFR/EA_MAL/ EA_PHI/EA_VEIT/EA_THAI/ EA_INA	ED_INDIA
7	Tuner	-	-	Ready
8	MRT Option	LVDS Format	JEIDA/VESA	JEIDA
		HVFlip	On/Off	Off
		TTX	On/Off	On
		China HD	On/Off	Off
		NT Conversion	On/Off	Off
		Num of AV	0/1/2	1
		Num of COMP	0/1/2	1
		Num of HDMI	0/1/2/3/4	1
		Num of USB	0/1/2	1
		E-POP DEFAULT	On/Off	On
		Num of headph	0/1	0

4-4. White Balance

4-4-1. Adjustment

1. Into the Factory Mode.
2. Select **ADC/WB** menu.
3. Select **White Balance** menu.

4-5. White Ratio (Balance) Adjustment

1. You can adjust the white ratio in factory mode (1:Calibration, 3:White-Balance).
2. Since the adjustment value and the data value vary depending on the input source, you have to adjust these in CVBS, Component 1 and HDMI 1 modes.
3. The optimal values for each mode are configured by default. It varies with Panel's size and Specification.

- Equipment : CS-210
- Pattern: MIK K-7256 #92 "Flat W/B Pattern" as standard
- Altenate Equipmet : CA200& anyone Master supported pattern#92(refer to right photo)
- Use other Equipment only after comparing the result with that of the Master equipment.
- Set Aging time : 60 min

Calibration and Manual setting for WB adjustment

- HDMI : Calibration at #24 Chessboard Pattern Manual adjustment at #92 pattern (720p)
- COMP: Calibration at #24 Chessboard Pattern Manual adjustment at #92 pattern (720p)
- CVBS: Calibration at #24 Chessboard Pattern Manual adjustment at #92 pattern (NTSC)

Note

If finishing in HDMI mode, adjustment coordinate is almost same in AV/COMP mode.

White Balance Manual adjustment

Type
LED_LOW

RGB Measurement		
Levels	Code	Check
10 IRE	0x01	O
20 IRE	0x02	O
30 IRE	0x03	X
40 IRE	0x04	O
50 IRE	0x05	X
60 IRE	0x06	X
70 IRE	0x07	O
80 IRE	0x08	X
90 IRE	0x09	X
100 IRE	0x0A	O

Panel Inspection Spec.				
Levels	Check	x(±)	y(±)	Gamma(±)
10 IRE	O	0.020	0.020	0.35
20 IRE	O	0.020	0.020	0.35
30 IRE	O	0.020	0.020	0.35
40 IRE	O	0.020	0.020	0.35
50 IRE	O	0.020	0.020	0.35
60 IRE	O	0.020	0.020	NA
70 IRE	O	0.020	0.020	NA
80 IRE	O	0.020	0.020	NA
90 IRE	O	0.020	0.020	NA
100 IRE	O	NA	NA	NA

Gray Check			Adjust Spec(xyL)			2nd Adjust Spec(xyL)		
Levels	Code	Check	x(±)	y(±)	L(±)	x(±)	y(±)	L(±)
10 IRE	0x01	X	0.007	0.007	0.11	0.007	0.007	0.11
20 IRE	0x02	O	0.007	0.007	0.08	0.007	0.007	0.08
30 IRE	0x03	X	0.007	0.007	0.06	0.007	0.007	0.06
40 IRE	0x04	O	0.005	0.005	0.05	0.005	0.005	0.05
50 IRE	0x05	X	0.005	0.005	0.04	0.005	0.005	0.04
60 IRE	0x06	X	0.005	0.005	0.03	0.005	0.005	0.03
70 IRE	0x07	O	0.004	0.004	0.02	0.004	0.004	0.02
80 IRE	0x08	X	0.004	0.004	0.01	0.004	0.004	0.01
90 IRE	0x09	X	0.004	0.004	0.01	0.004	0.004	0.01
100 IRE	0x0A	X	NA	NA	NA	NA	NA	NA

Target Gamma		2.30	
Black	x	y	Contrast
	0.231	0.208	300000
Target xy	Option	x	y
	Auto	0.282	0.299

Panel Spec.		±	
Gamma	2.2	0.30	20~128
x	0.281	0.030	255
y	0.288	0.030	
ACC x	255 white	0.015	26~255
ACC y	x,y value	0.015	

Color Tone Target			Spec.	
High	x	y	x(±)	y(±)
COOL	0.274	0.286	0.004	0.004
NORMAL	0.293	0.307		
WARM2	0.328	0.353		
Low	x	y	x(±)	y(±)
COOL	NA	NA	NA	NA
NORMAL	NA	NA		
WARM2	NA	NA		

10IRE Gamma target	2.30
RetryCount	3

4-6. Software Upgrade

Software Upgrade can be performed by downloading the. latest firmware from samsung.com to a USB memory device.

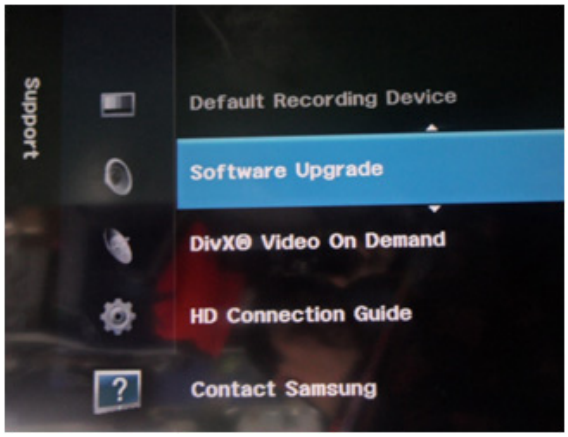
- Current Version - The software already installed in the TV.

Software is represented as ‘Year/Month/Day_Version’.

4-6-1. How to Check the Software Version

■ Use the Main Menu

1. Click the "MENU" key in remote controller.
2. Select "Support" menu.
3. Locate the menu cursor "Software Upgrade" menu.
4. Click the "INFO" key.
   - Check the Main SW and Micom version.



■ Use the Factory Mode

Option	T-MXL0MASC-****.*
SubOptions	Build Date:Dec 16 2013
Sound	HDCP SUCCESS
Debug	OPTION:**********
SVC	USB Serial:OFF
W/B Adjust	
ADC Adjust	
Advanced	
Tuner Self Test	
Shop Option	

4-6-2. How to Upgade Software and Micom

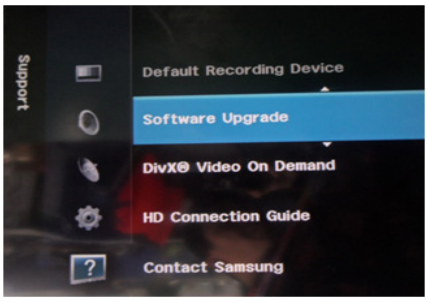
Insert a USB drive containing the firmware upgrade downloaded from samsung.com into the TV. Please be careful not to disconnect the power or remove the USB drive while upgrades are being applied. The TV will turn off and turn on automatically after completing the firmware upgrade. Please check the firmware version after the upgrades are complete (the new version will have a higher number than the older version). When software is upgraded, video and audio settings you have made will return to their default (factory) settings. We recommend you write down your settings before beginning firmware update. After update is completed, restore your previous settings.

■ Main Software Upgrade

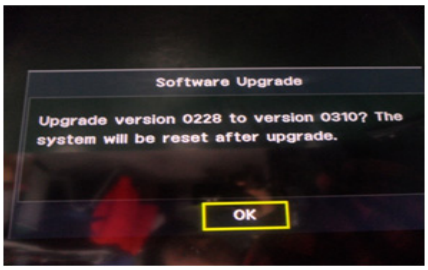
1. SSave the firmware folder to the root directory of a USB drive.
- Connect the USB.

2. Click the "MENU" key in Remote Controler.

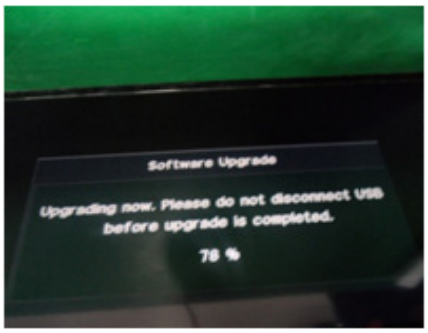
3. Select "Support" menu.
Select "Software Upgrade"



4. Click the "ENTER" key.

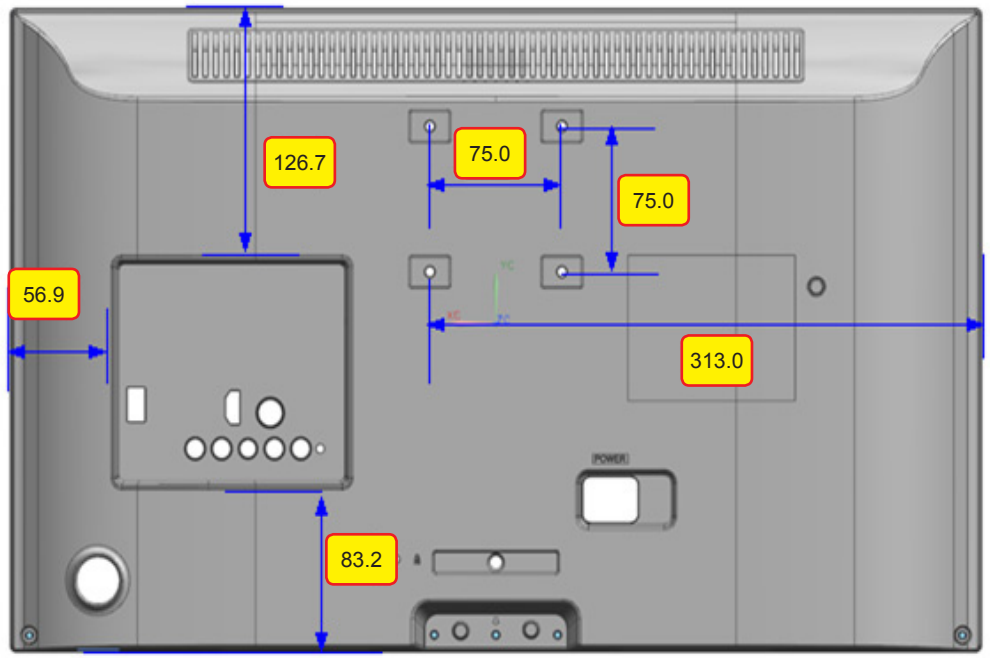


5. Click the "ENTER" key.
- Wait for upgrade complete.
- Check the Software Version.



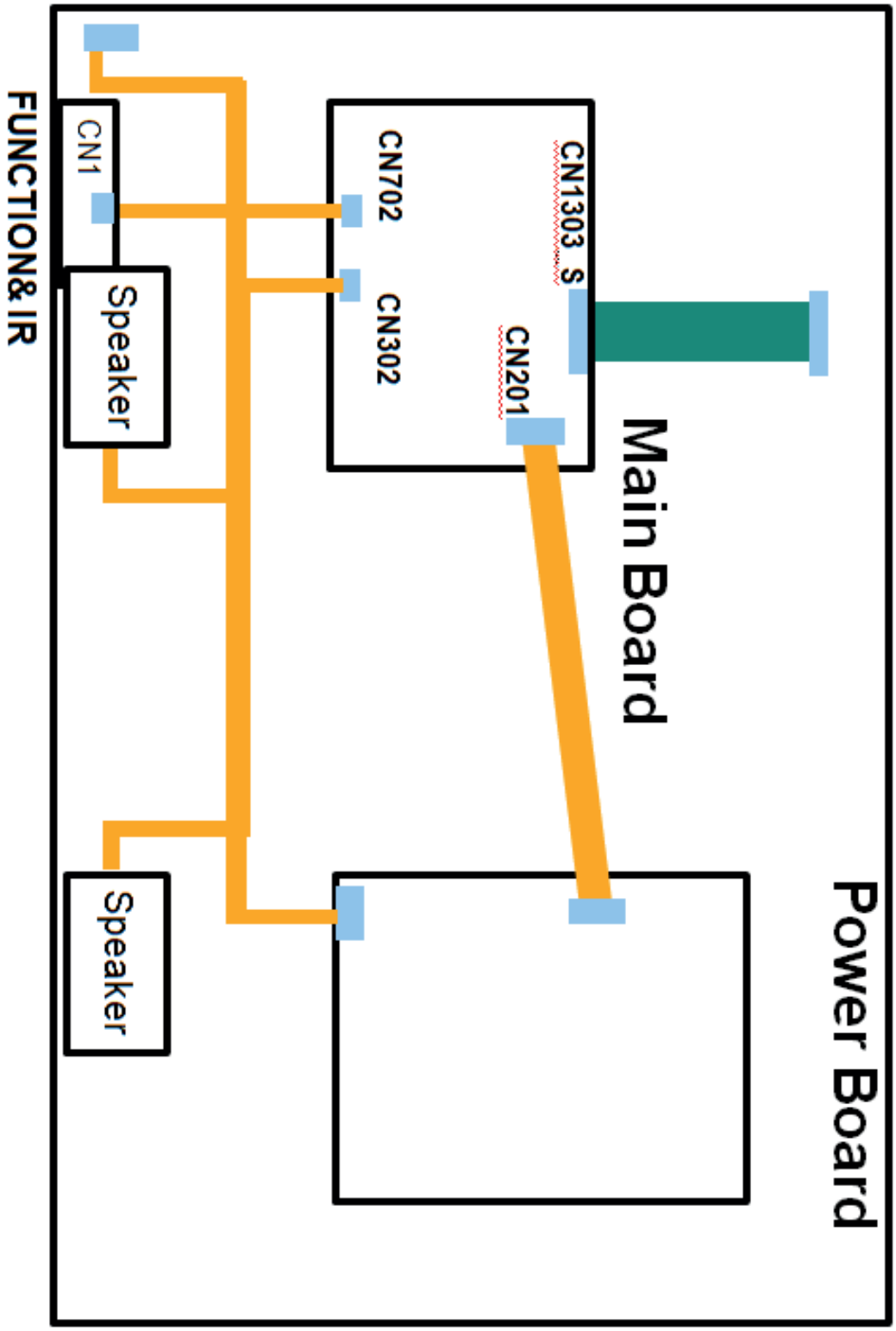
4-7. Rear Cover Dimension

■ UA23H4003AR



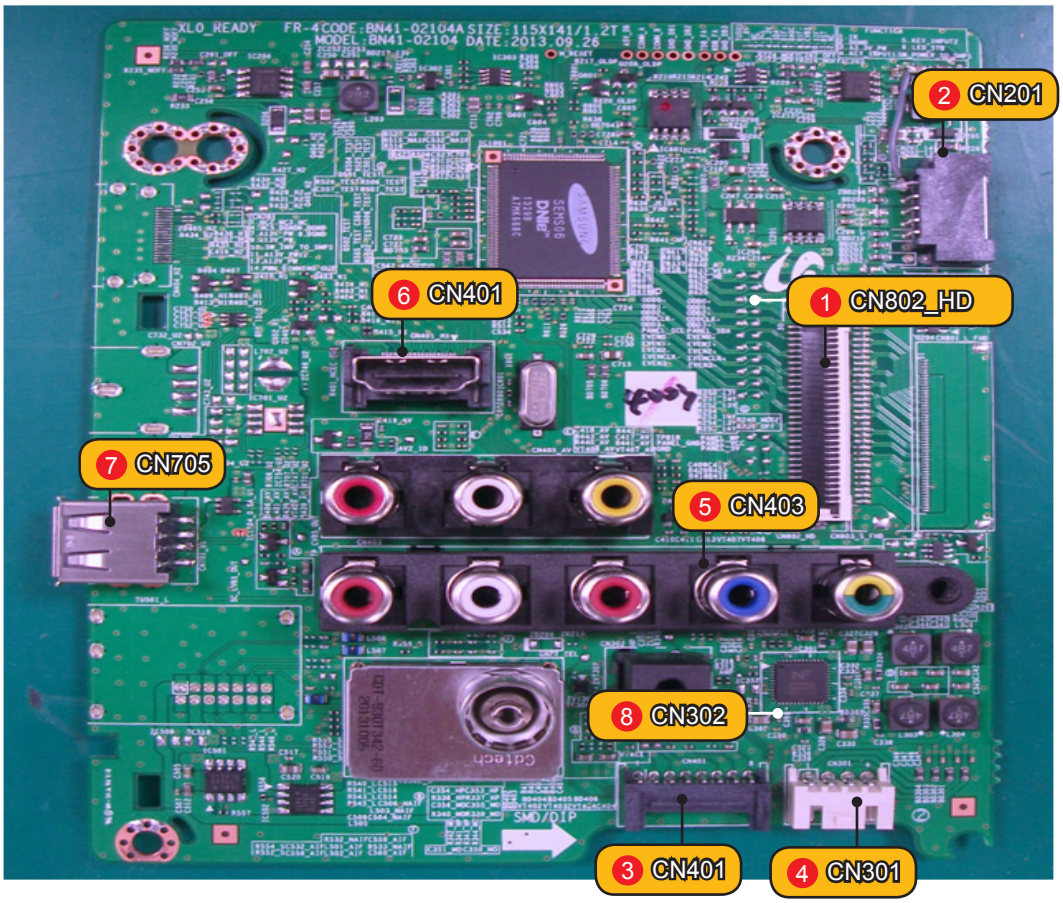
5. Wiring Diagram

5-1. Wiring Diagram



5-2. Connector

■ Main Board



❶ CN802_HD (to Panel)			
1	PANEL_13V_PW	16	EVEN_TXCLK+_LVDS
2	PANEL_13V_PW	17	EVEN_TXCLK-_LVDS
3	PANEL_13V_PW	18	GND
4	PANEL_13V_PW	19	EVEN_TX2+_LVDS
5	PANEL_13V_PW	20	EVEN_TX2-_LVDS
6	GND	21	GND
7	GND	22	EVEN_TX1+_LVDS
8	GND	23	EVEN_TX1-_LVDS
9	TCON_WP	24	GND
10	TP818	25	EVEN_TX0+_LVDS
11	NC	26	EVEN_TX0-_LVDS
12	GND	27	GND
13	EVEN_TX3+_LVDS	28	TCON_SCL
14	EVEN_TX3-_LVDS	29	TCON_SDA
15	GND	30	NC

❷ CN201 (to Powr board)			
1	GND	6	SW_POWER_TO_SMPS
2	GND	7	D13V_PW
3	A13V_PW	8	PWM_DIMMING_OUT
4	GND	9	A13V_PW
5	D13V_PW	10	UNDER_DRIVER

❸ CN401 (FUNCTION)			
1	IR	5	MSDA
2	GND	6	KEY1
3	A3.3V	7	KEY2
4	MSCL	8	GND

4 CN301 (SPEAKER)			
1	R+	3	L+
2	R-	4	L-

5 CN403 (COMPONETN)			
1	GND	9	TEST_COMP_PR
2	COMP1_Y_CVBS	10	GND
3	IDENT_VIDEO1	11	COMP1_SL_IN
4	GND	12	TEST_SL
5	COMP1_PB	13	GND
6	IDENT_COMP1	14	COMP1_SR_IN
7	GND	15	TEST_SR
8	COMP1_PR		

6 CN401 (HDMI)			
1	HDMI1_RX2+	11	GND
2	GND	12	HDMI1_RXCLK-
3	HDMI1_RX2-	13	HDMI_CEC
4	HDMI1_RX1+	14	GND
5	GND	15	SCL
6	HDMI1_RX1-	16	SDA
7	HDMI1_RX0+	17	GND
8	GND	18	5V
9	HDMI1_RX0-	19	HPD
10	HDMI1_RXCLK+		

7 CN705 (USB1)			
1	USB_VCC	3	USB_DP
2	USB_DM	4	GND

8 CN302 (Audio Out)			
1	GND	5	NC
2	SL_OUT	6	IDENT
3	SR_OUT	7	GND
4	NC		

5-3. Connector Functions

Connector	Function
CN201 ↔ IP CN	Supply main power and dimming signal from IP Board to Main Board.
CN1301_FHD ↔ T-CON CNF1	The LVDS signal transfered from Main Board to Panel.
CN1302_HD ↔ T-CON CNF1	The LVDS signal transfered from Main Board to Panel.